Instructions - Parts List

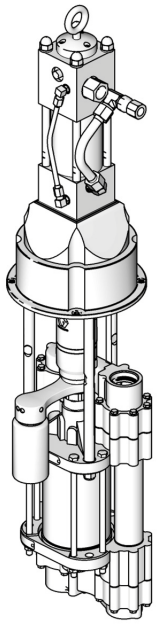
Viscount® 4-Ball Pumps

3A0537G
EN

Hydraulic-powered pumps for low pressure, high volume circulation of finishing materials. Do not use for flushing or purging lines with caustics, acids, abrasive line strippers, and other similar fluids. For professional use only.

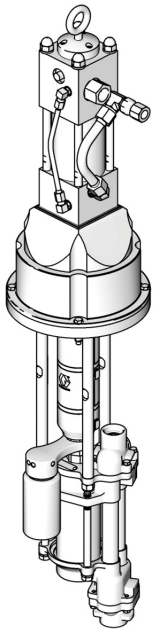
Important Safety Instructions
Read all warnings and instructions in this manual. Save these instructions.

See page 3 for model information, including maximum working pressure and approvals.



TI15609a

Viscount II Pump with 4000cc 4-Ball Lower



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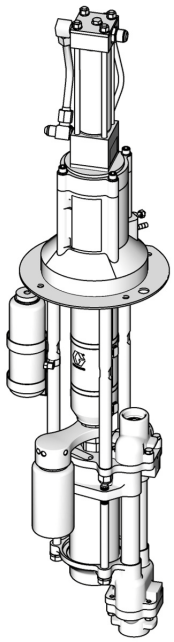
Viscount II Pump with 2000cc 4-Ball Lower



TI15601a

Viscount I Plus Pump with 1000cc 4-Ball Lower

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PROVEN QUALITY. LEADING TECHNOLOGY.

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Related Manuals

Part No.	Description
308330	Viscount I Plus Hydraulic Motor manual
308048	Viscount II Hydraulic Motor manual
3A0539	4-Ball Lower manual (750cc, 1000cc, 1500cc, and 2000cc)
3A0540	4-Ball Lower manual (3000cc and 4000cc)

Models

Pumps with 750cc, 1000cc, 1500cc, or 2000cc 4-Ball Lowers

Model No.	Series	Maximum Pump Working Pressure psi (MPa, bar)	Lower Size	Motor	Connection Style	Material	Rod Material	Cylinder Material
24E322	**A**	450 (3.1, 31.0)	750cc	Viscount I Plus	npt	cst	Chromex™	Nitride
24E323	**A**	450 (3.1, 31.0)	750cc	Viscount I Plus	tri-clamp	sst	Chromex	Chrome
24E324	**A**	450 (3.1, 31.0)	750cc	Viscount I Plus	tri-clamp	sst	Chromex	MaxLife®
24E485	**A**	450 (3.1, 31.0)	750cc	Viscount I Plus	npt	sst	Chromex	Chrome
24E486	**A**	450 (3.1, 31.0)	750cc	Viscount I Plus	npt	sst	Chromex	MaxLife
24E325	**A**	300 (2.1, 21.0)	1000cc	Viscount I Plus	npt	cst	Chromex	Chrome
24E326	**A**	300 (2.1, 21.0)	1000cc	Viscount I Plus	tri-clamp	sst	Chromex	Chrome
24E327	**A**	300 (2.1, 21.0)	1000cc	Viscount I Plus	tri-clamp	sst	Chromex	MaxLife
24E487	**A**	300 (2.1, 21.0)	1000cc	Viscount I Plus	npt	sst	Chromex	Chrome
24E488	**A**	300 (2.1, 21.0)	1000cc	Viscount I Plus	npt	sst	Chromex	MaxLife
24E328	**A**	225 (1.6, 16.0)	1500cc	Viscount I Plus	npt	cst	Chromex	Chrome
24E329	**A**	225 (1.6, 16.0)	1500cc	Viscount I Plus	tri-clamp	sst	Chromex	Chrome
24E330	**A**	225 (1.6, 16.0)	1500cc	Viscount I Plus	tri-clamp	sst	Chromex	MaxLife
24E489	**A**	225 (1.6, 16.0)	1500cc	Viscount I Plus	npt	sst	Chromex	Chrome
24E490	**A**	225 (1.6, 16.0)	1500cc	Viscount I Plus	npt	sst	Chromex	MaxLife
24E331	**A**	167 (1.2, 12.0)	2000cc	Viscount I Plus	npt	cst	Chromex	Chrome
24E332	**A**	167 (1.2, 12.0)	2000cc	Viscount I Plus	tri-clamp	sst	Chromex	Chrome
24E333	**A**	167 (1.2, 12.0)	2000cc	Viscount I Plus	tri-clamp	sst	Chromex	MaxLife
24E491	**A**	167 (1.2, 12.0)	2000cc	Viscount I Plus	npt	sst	Chromex	Chrome
24E492	**A**	167 (1.2, 12.0)	2000cc	Viscount I Plus	npt	sst	Chromex	MaxLife
24E334	**A**	460 (3.2, 32.0)	2000cc	Viscount II	npt	cst	Chromex	Chrome
24E335	**A**	460 (3.2, 32.0)	2000cc	Viscount II	tri-clamp	sst	Chromex	Chrome
24E336	**A**	460 (3.2, 32.0)	2000cc	Viscount II	tri-clamp	sst	Chromex	MaxLife
24E493	**A**	460 (3.2, 32.0)	2000cc	Viscount II	npt	sst	Chromex	Chrome
24E494	**A**	460 (3.2, 32.0)	2000cc	Viscount II	npt	sst	Chromex	MaxLife

Pumps with 3000cc or 4000cc 4-Ball Lowers

Model No.	Series	Maximum Pump Working Pressure psi (MPa, bar)	Lower Size	Motor	Connection Style	Material	Rod Material	Cylinder Material
24E337	**A**	400 (2.8, 28.0)	3000cc	Viscount II	npt	cst	Chromex	Chrome
24E338	**A**	400 (2.8, 28.0)	3000cc	Viscount II	npt	sst	Chromex	Chrome
24E339	**A**	400 (2.8, 28.0)	3000cc	Viscount II	npt	sst	Chromex	MaxLife
24E340	**A**	300 (2.1, 21.0)	4000cc	Viscount II	npt	cst	Chromex	Chrome
24E341	**A**	300 (2.1, 21.0)	4000cc	Viscount II	npt	sst	Chromex	Chrome
24E342	**A**	300 (2.1, 21.0)	4000cc	Viscount II	npt	sst	Chromex	MaxLife

Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

⚠WARNING

PERIGO DE FOGO E EXPLOSÃO

Os vapores inflamáveis na **área de trabalho**, tais como os provenientes de solventes e tintas, podem inflamar-se ou explodir. Para ajudar a evitar incêndio e explosão:

- Utilize o equipamento apenas em áreas bem ventiladas;
- Elimine todas as fontes de ignição, como, por exemplo, luzes piloto, cigarros, luzes elétricas portáteis e plásticos de proteção (potencial arco estático).
- Mantenha a área de trabalho sem detritos, incluindo solvente, panos e gasolina;
- Não ligue nem desligue cabos de alimentação ou interruptores, na presença de vapores inflamáveis;
- Ligue à terra todo o equipamento na área de trabalho. Consulte as instruções de **Ligação à terra** .
- Utilize apenas tubos flexíveis com ligação à terra;
- Segure a pistola firmemente apoiando-a na parede do balde em contacto com a terra, quando estiver a descarregar para dentro do mesmo;
- Se ocorrerem faíscas de estática ou se sentir um choque elétrico, **interrompa a utilização imediatamente.** Não utilize o equipamento até identificar e corrigir o problema.
- Tenha sempre um extintor operacional na área de trabalho.

A carga estática pode-se acumular nas peças plásticas durante a limpeza e pode disparar e inflamar vapores inflamáveis. Para ajudar a evitar incêndio e explosão:

- Limpe as peças plásticas apenas em áreas bem ventiladas.
- Não limpe com um pano seco.
- Não opere pistolas eletrostáticas numa área de trabalho de equipamento.

PERIGO DE EQUIPAMENTO PRESSURIZADO

O produto proveniente da pistola/pistola de distribuição, fugas ou componentes danificados poderá entrar em contacto com os olhos ou com a pele e provocar ferimentos extremamente graves.

- Siga o **Procedimento de Descompressão** neste manual, quando parar de pintar e antes de dar início aos procedimentos de limpeza, verificação ou manutenção.
- Aperte todas as ligações relativas ao produto antes de utilizar o equipamento.
- Verifique diariamente todos os tubos e uniões. Substitua imediatamente as peças gastas ou danificadas.

PERIGO EMERGENTE DE PRODUTOS OU VAPORES TÓXICOS

Os líquidos ou vapores tóxicos podem provocar lesões graves ou morte se entrarem em contacto com os olhos e a pele, ou se forem inalados ou engolidos.

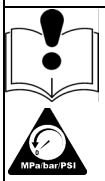
- Leia as folhas de dados de segurança do material (MSDS) para conhecer os perigos específicos dos líquidos que está a utilizar.
- Armazene os líquidos perigosos em recipientes aprovados e elimine-os em conformidade com as diretrizes aplicáveis.

⚠WARNING

EQUIPAMENTO DE PROTECÇÃO PESSOAL

Utilize equipamento de proteção adequado ao usar o equipamento ou se estiver na área de funcionamento do mesmo. O equipamento protege-o de lesões graves, tais como lesões oculares, perda de audição, inalação de vapores tóxicos e queimaduras. Este equipamento inclui, mas não é limitado a:

- Proteção para os olhos e ouvidos.
- Respiradores, roupa protetora e luvas, tal como recomendado pelo fabricante do líquido e solvente.



PERIGO DE MÁ UTILIZAÇÃO DO EQUIPAMENTO

A utilização incorreta do equipamento poderá resultar em ferimentos graves ou morte.

- Não utilize a unidade se estiver cansado ou sob a influência de drogas ou de álcool.
- Não exceda a pressão de trabalho ou o nível de temperatura máximo do componente do sistema com a classificação mais baixa. Consulte a **Dados Técnicos** em todos os manuais do equipamento.
- Utilize líquidos e solventes compatíveis com as peças do equipamento em contacto com o líquido. Consulte a **Dados Técnicos** em todos os manuais do equipamento. Leia as advertências dos fabricantes do líquido e do solvente. Para obter informações completas relativas ao material que utiliza, solicite a folha de dados de segurança do material (MSDS) ao distribuidor ou ao revendedor.
- Não abandone a área de trabalho enquanto o equipamento se encontrar energizado ou sob pressão. Desligue todo o equipamento e siga o **Procedimento de Descompressão** quando o equipamento não está a ser utilizado.
- Verifique diariamente o equipamento. As peças danificadas ou com desgaste devem ser imediatamente reparadas ou substituídas apenas por peças genuínas do fabricante.
- Não altere nem modifique este equipamento.
- Utilize o equipamento apenas para o fim a que se destina. Solicite informações ao seu distribuidor.
- Afaste os tubos flexíveis e cabos de áreas com movimento, pontas afiadas, peças em movimento e superfícies quentes.
- Não dê nós nem dobre os tubos flexíveis, nem os utilize para puxar o equipamento.
- Mantenha as crianças e os animais afastados da área de trabalho.
- Cumpra todas as normas de segurança aplicáveis.

PERIGO RESULTANTE DE PEÇAS EM MOVIMENTO

As peças em movimento podem entalar ou amputar os dedos e outras partes do corpo.

- Mantenha-se afastado das peças em movimento.
- Não utilize o equipamento tendo removido as respetivas proteções e coberturas.
- O equipamento sob pressão pode começar a funcionar sem aviso. Antes de efetuar ações de verificação, deslocação ou assistência no equipamento, siga o **Procedimento de Descompressão** e desligue todas as fontes de alimentação.

Installation

Grounding

The equipment must be grounded. Grounding reduces the risk of static and electric shock by providing an escape wire for the electrical current due to static build up or in the event of a short circuit.

Pump: use a ground wire and clamp. See FIG. 1. Loosen the locknut (W) of the grounding lug (Z). Insert one end of the wire (Y) in the ground lug and tighten the locknut securely. Connect the ground clamp to a true earth ground. Order Part No. 237569, Ground Wire and Clamp.

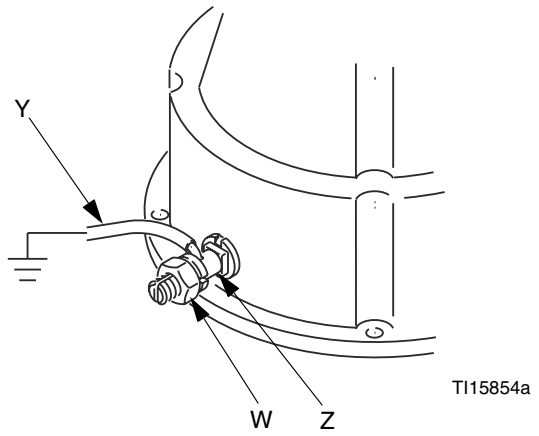


FIG. 1 Ground Wire

Air and fluid hoses: use only electrically conductive hoses with a maximum of 500 ft. (150 m) combined hose length to ensure grounding continuity. Check the electrical resistance of hoses. If total resistance to ground exceeds 25 megohms, replace hose immediately.

Hydraulic power supply: follow manufacturer's recommendations.

Surge tank: use a ground wire and clamp.

Dispense valve: ground through a connection to a properly grounded fluid hose and pump.

Fluid supply container: follow local code.

Object being sprayed: follow local code.

Solvent pails used when flushing: follow local code. Use only conductive metal pails, placed on a grounded surface. Do not place the pail on a nonconductive surface, such as paper or cardboard, which interrupts grounding continuity.

To maintain grounding continuity when flushing or relieving pressure: hold metal part of the spray gun firmly to the side of a grounded metal pail, then trigger the gun.

Stand Mount

Mount the pump in the accessory pump stand (B). Use Part No. 253692 Stand for 750, 1000, 1500, and 2000cc Pumps (see FIG. 2, page 9) and Part No. 218742 Stand for 3000 and 4000cc Pumps (see FIG. 3, page 10).

See **Mounting Stand Hole Layouts** on page 22. Secure the stand to the floor with M19 (5/8 in.) bolts which engage at least 152 mm (6 in.) into the concrete floor to prevent the pump from tipping.

Wall Mount

1. Ensure the wall is strong enough to support the weight of the pump assembly and accessories, fluid, hoses, and stress caused during pump operation.
2. Ensure that the mounting location has sufficient clearance for easy operator access.
3. Position the wall bracket at a convenient height, ensuring that there is sufficient clearance for the fluid suction line and for servicing the lower.
4. Drill four 7/16 in. (11 mm) holes using the bracket as a template. Use any of the three mounting hole groupings in the bracket. See **255143 Wall Mount Bracket**, page 23.
5. Bolt the bracket securely to the wall using bolts and washers designed to hold in the wall's construction.
6. Attach the pump assembly to the mounting bracket.
7. Connect air and fluid hoses.

Plumbing

Install a fluid shutoff valve (D) between the mix tank (A) and the pump.

When using a stainless steel pump, use stainless steel plumbing to maintain a corrosion-resistant system.

Flush Before Using Equipment

The equipment was tested with lightweight oil, which is left in the fluid passages to protect parts. To avoid contaminating your fluid with oil, flush the equipment with a compatible solvent before using the equipment. See **Flushing**, page 12.

Accessories

Install the following accessories in the order shown in FIG. 2, using adapters as necessary.

Hydraulic Power Supply

NOTICE

The hydraulic power supply must be kept clean at all times to avoid damage to the motor and hydraulic power supply.

1. Blow out hydraulic lines with air and flush thoroughly before connection to the motor.
2. Plug hydraulic inlets, outlets, and line ends when disconnecting them for any reason.

Be sure the power supply can provide sufficient power to the motor. Be sure the power supply is equipped with a suction filter to the hydraulic pump.

Hydraulic Supply Line

- For Viscount I Plus motors, the hydraulic inlet on the motor is 3/4 in., 37° flare. Use a minimum 1/2 in. (13 mm) ID hydraulic supply line (L).
- For Viscount II motors, use a minimum 13 mm (1/2 in.) ID supply line (L). The motor has a 3/4 npt(f) hydraulic oil supply fitting.
- **Supply line shutoff valve (S):** isolates the motor when servicing the system.
- **Hydraulic fluid pressure gauge (P):** monitors the hydraulic oil pressure to the motor to avoid overpressurizing the motor or lower.
- **Pressure- and temperature-compensated flow control valve (T):** prevents the motor from running too fast, which can damage it.
- **Pressure reducing valve (N), which has a drain line (M) running to the return line (K):** controls the hydraulic pressure to the motor.

Hydraulic Return Line

- For Viscount I Plus motors, the hydraulic outlet on the motor is 7/8 in., 37° flare. Use a minimum 5/8 in. (16 mm) ID hydraulic return line (K).
- For Viscount II motors, use a minimum 22 mm (7/8 in.) ID return line (K). The motor has a 1 in. npt(f) hydraulic oil return fitting.
- **Return line shutoff valve (R):** isolates the motor when servicing the system.

NOTICE

To avoid damage to the pump, never use the return line shutoff valve to control the hydraulic flow. Do not install any flow control devices on the hydraulic return line.

- **Return fluid filter (J):** removes residue from the hydraulic fluid to help keep the system running smoothly (10 micron size).

Fluid Line

For typical installation, see FIG. 2 on page 9.

- **Fluid filter:** with a 60 mesh (250 micron) stainless steel element to filter particles from the fluid as it leaves the pump.
- **Fluid drain valve (U):** required in your system, to relieve fluid pressure in the hose and gun.
- **Fluid shutoff valve (D):** shuts off fluid flow.

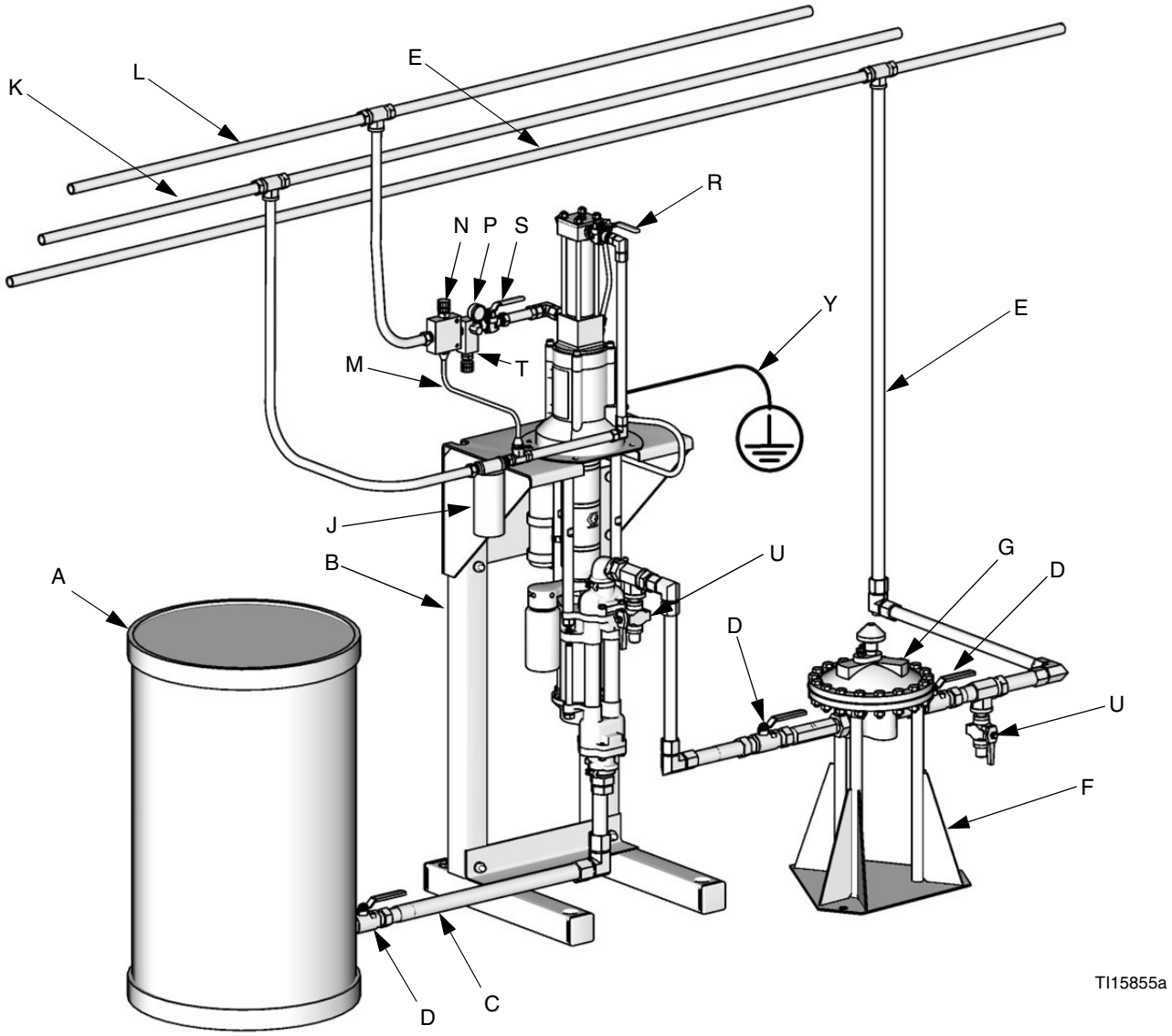


FIG. 2. Typical Installation for 750, 1000, 1500, and 2000cc Pumps (Viscount I Plus Motor Shown)

Key:

A Mix Tank
B 253692 Pump Stand
C Fluid Supply Line; 1-1/2 in. (38 mm) minimum diameter
D Fluid Shutoff Valve
E Fluid Line; 1 in. (25 mm) minimum diameter
F Surge Tank Stand
G Surge Tank
J 10 Micron Return Filter
K Hydraulic Return Line
L Hydraulic Supply Line
M Drain Line
N Pressure Reducing Valve
P Hydraulic Pressure Gauge
R Return Line Shutoff Valve
S Supply Line Shutoff Valve
T Flow Control Valve
U Fluid Drain Valve (required)
Y Ground Wire (required see page 6 for installation)

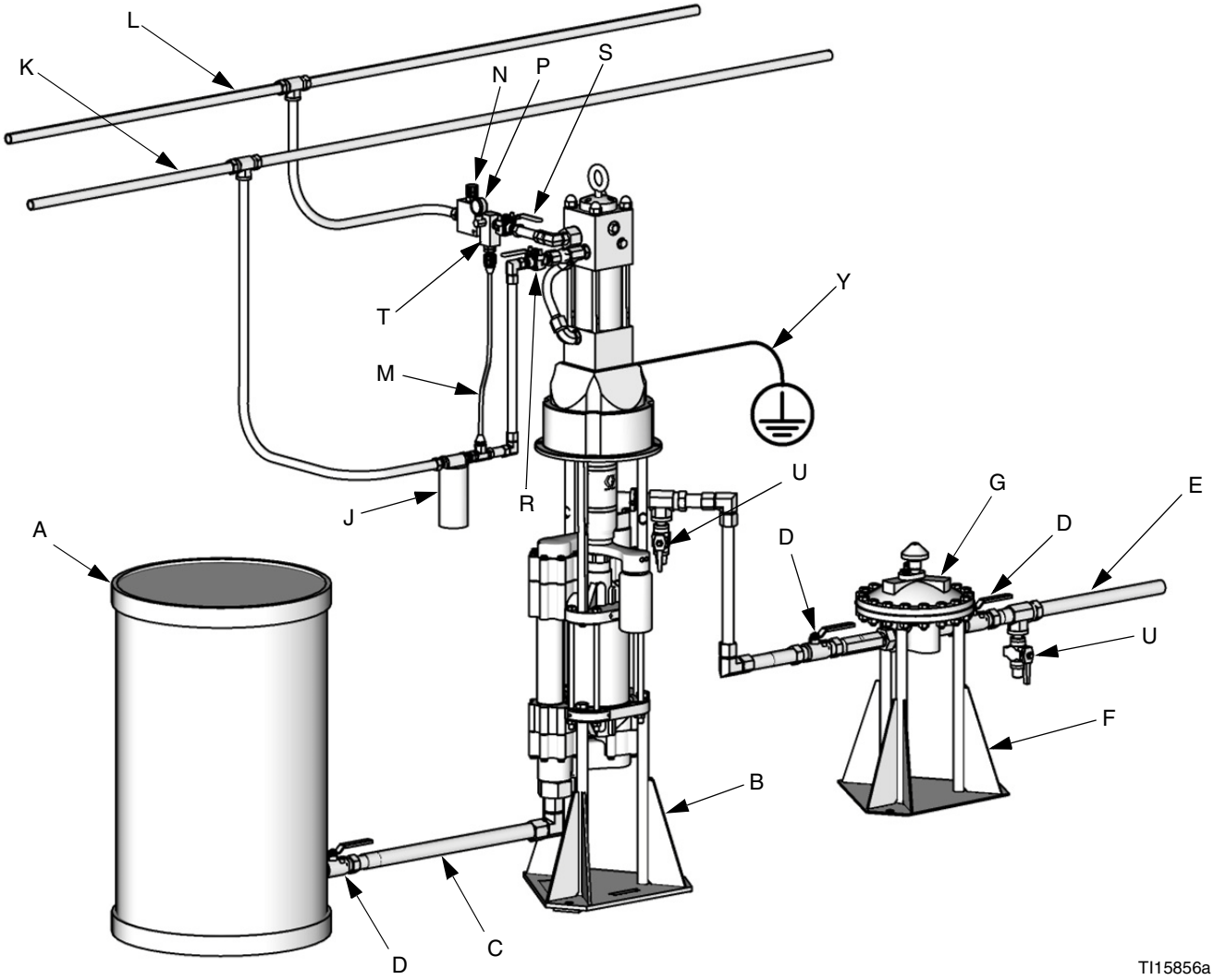


FIG. 3. Typical Installation for 3000 and 4000cc Pumps (Viscount II Motor Shown)

Key:

A Mix Tank
B 218742 Pump Stand
C Fluid Supply Line; 1-1/2 in. (38 mm) minimum diameter
D Fluid Shutoff Valve
E Fluid Line; 1 in. (25 mm) minimum diameter
F Surge Tank Stand
G Surge Tank
J 10 Micron Return Filter
K Hydraulic Return Line
L Hydraulic Supply Line
M Drain Line
N Pressure Reducing Valve
P Hydraulic Pressure Gauge
R Return Line Shutoff Valve
S Supply Line Shutoff Valve
T Flow Control Valve
U Fluid Drain Valve (required)
Y Ground Wire (required see page 6 for installation)

Operation

Pressure Relief Procedure

1. Shut off the hydraulic supply line valve (S) first, then the return line valve (R).
2. Open the dispensing valve, if used.
3. Open all fluid drain valves (U) in the system, having a waste container ready to catch drainage. Leave drain valve(s) open until you are ready to pump again.

NOTICE

When shutting down the hydraulic system, always shut off the hydraulic supply line shutoff valve (S) first, and then the return line shutoff valve (R) to prevent overpressurizing the motor or its seals. When starting the hydraulic system, open the return line shutoff valve first.

Prime the Pump

1. Fill the TSL reservoir to the Maximum fill line with Throat Seal Liquid (TSL). See FIG. 4 on page 13.

NOTE: During operation the TSL level in the reservoir will fluctuate slightly at pump changeover.

2. Close the flow control valve (T) by turning knob counterclockwise reducing pressure to zero. Close the supply line shutoff valve (S) and the return line shutoff valve (R). Also verify that all drain valves (U) are closed.
3. Check that all fittings throughout system are tightened securely.
4. Start the hydraulic power supply.
5. Open the return line shutoff valve (R), then the supply line shutoff valve (S). Slowly turn the flow control valve (T) clockwise, increasing pressure until pump starts.
6. Cycle pump slowly until all air is pushed out and pump and hoses are fully primed.
7. Verify that pump actuations are priming the pump wet-cup. If not, confirm that the TSL pump piston is being depressed at bottom changeover, and that reservoir check valves are not stuck closed.
8. Close the fluid shutoff valve (D) downstream of the pump. The pump should stall against pressure.

NOTE: In a circulation system, the pump operates continuously until the power supply is shut off. In a direct-supply system, the pump starts when the dispense valve is opened, and stops when the dispense valve is closed.

Stop the Pump at the Bottom of Its Stroke

Relieve the pressure when you stop the pump for any reason. Stop the pump on the downstroke, before the motor changes over.

NOTICE

Failure to stop the pump at the bottom of its stroke allows fluid to dry on the piston rod, which can damage the throat packings and the TSL pump piston seal when the pump is restarted.

Shutdown

Follow **Pressure Relief Procedure**, page 11.

Always flush the pump before the fluid dries on the displacement rod. See **Flushing** on page 12.

Maintenance

Preventive Maintenance Schedule

The operating conditions of your particular system determine how often maintenance is required. Establish a preventive maintenance schedule by recording when and what kind of maintenance is needed, and then determine a regular schedule for checking your system. Your maintenance schedule should include the following:

Flushing

- Flush before changing colors, before fluid can dry in the equipment, at the end of the day, before storing, and before repairing equipment.
- Flush at the lowest pressure possible. Check connectors for leaks and tighten as necessary.
- Flush with a fluid that is compatible with the fluid being dispensed and the equipment wetted parts.

Mix Tank Volume

Don't let the mix tank run dry. When the tank is empty, the pump demands more power as it tries to suck in some fluid. This causes the pump to run too fast, which can seriously damage the pump.

Hydraulic Power Supply Check

Carefully follow the hydraulic power supply manufacturer's recommendations on reservoir and filter cleaning, and periodic changes of hydraulic fluid.

Stall Test

Perform a stall test periodically to ensure the piston seal is in good working condition and prevent system overpressurization:

Close the fluid shutoff valve (D) closest to the pump on the downstroke and be sure that the pump stalls. Open the fluid shutoff valve to restart the pump. Close the fluid shutoff valve (D) closest to the pump on the upstroke and be sure that the pump stalls.

NOTICE

Do not allow the pump to run quickly for a long period of time as this may damage the packings.

Stop the pump on the downstroke, before the air motor changes over.

NOTICE

Failure to stop the pump at the bottom of its stroke allows fluid to dry on the piston rod, which can damage the throat packings and the TSL pump piston seal when the pump is restarted.

Changing the TSL

Check the condition of the TSL and the level in the reservoir every week, minimum. TSL should be changed at least every month.

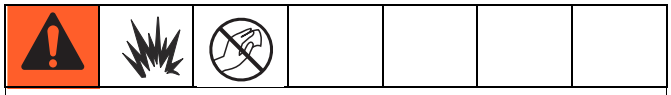
Part No. 206995 Throat Seal Liquid (TSL) carries residue from the pump rod into the reservoir. Discoloration of the TSL fluid is to be expected during normal operation. After some time the TSL will thicken and darken, and must be replaced. Thick, dirty TSL will not pump through the lines and will harden in the pump wet-cup.

How long TSL lasts depends on which chemicals are used, how much is used, what pressure, and condition of the pump seal and rod.

A drop in the level of TSL in the reservoir indicates that the throat packings are starting to wear. Add TSL to the reservoir and keep the level above the Minimum fill line. Monitor the usage and condition of the TSL. If pumped material bypasses the throat packings and enters the TSL reservoir, replace the packings.

To change the TSL:

1. Shut off the pump.



To avoid the buildup of static charge, do not rub the plastic bottle with a dry cloth while it is attached to the pump. Remove the bottle to clean, if needed.

2. Remove and empty the reservoir bottle. Clean any residue.
3. Clean screen (Z) of inlet check valve (VI). If check valves are not sealing and dirty TSL is getting into the wet-cup, replace the check valves (VI, VO). See FIG. 4.
4. Fill the reservoir to the Maximum fill line with Throat Seal Liquid (TSL).
5. Run pump. Each time pump rod reaches bottom of stroke, check that some TSL is pumped from reservoir through wet-cup and back to reservoir.

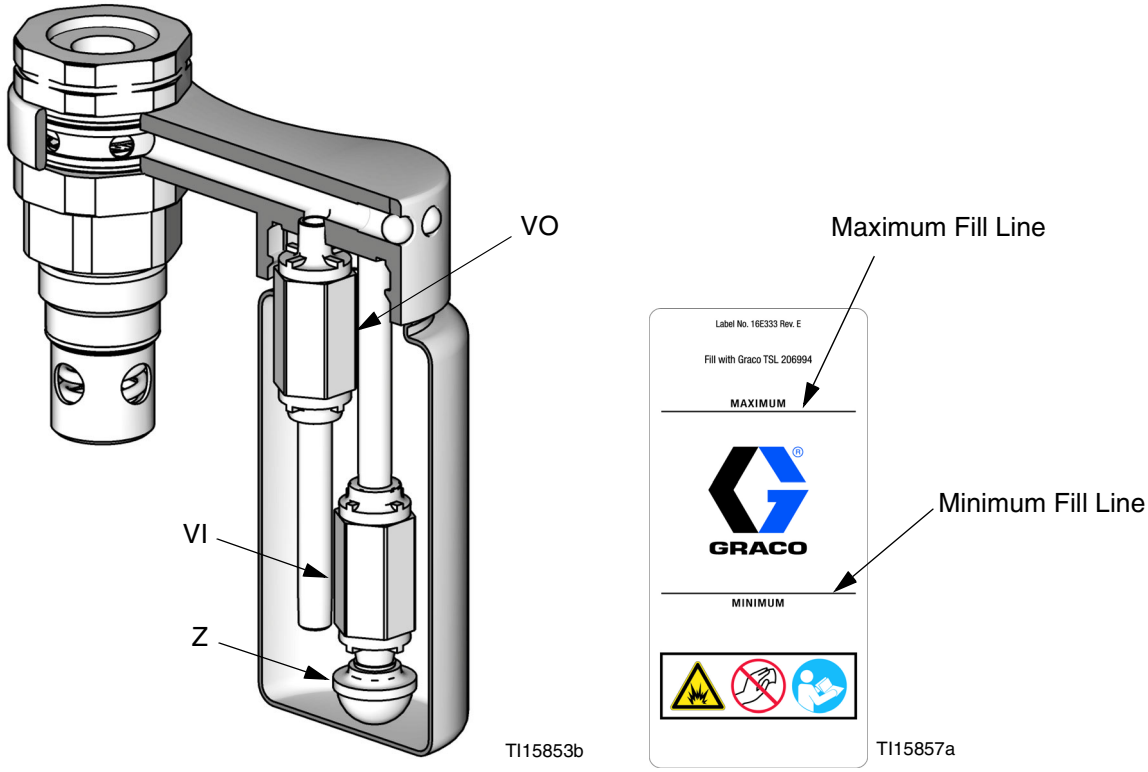


FIG. 4. Cutaway of TSL Reservoir, and Fill Lines

Troubleshooting

Problem	Cause	Solution
Pump output low on both strokes.	Restricted hydraulic supply lines.	Clear any obstructions; be sure all shutoff valves are open; increase pressure, but do not exceed maximum working pressure.
	Exhausted fluid supply.	Refill and reprime pump.
	Clogged fluid outlet line, valves, etc.	Clear.
	Worn piston packing.	Replace. See lower manual.
Pump output low on only one stroke.	Held open or worn ball check valves.	Check and repair.
	Worn piston packings.	Replace. See lower manual.
No output.	Improperly installed ball check valves.	Check and repair.
Pump operates erratically.	Exhausted fluid supply.	Refill and reprime pump.
	Held open or worn ball check valves.	Check and repair.
	Worn piston packing.	Replace. See lower manual.
	Excessive hydraulic fluid supply pressure to motor.	See motor manual.
Pump will not operate.	Restricted hydraulic supply lines.	Clear any obstructions; be sure all shut off valves are open; increase pressure, but do not exceed maximum working pressure.
	Exhausted fluid supply.	Refill and reprime pump.
	Clogged fluid outlet line, valves, etc.	Clear.
	Damaged hydraulic motor.	See motor manual.
	Fluid dried on piston rod.	Disassemble and clean pump. See lower manual. In future, stop pump at bottom of stroke.

Repair

Disassembly

NOTE: The 3000 and 4000cc pumps are easiest to repair when left in the Part No. 218742 accessory pump stand and disassembled as instructed in the lower manual. For repair at a remote location, have another pump stand available.

1. Relieve the pressure, see **Pressure Relief Procedure** page 11.
2. Disconnect the hoses from the lower and plug the ends to prevent fluid contamination.
3. See FIG. 5. Remove the 2-piece shield (122) by inserting a screwdriver straight into the slot, and using it as a lever to release the tab. Repeat for all tabs. **Do not** use the screwdriver to pry the shields apart.
4. Loosen the coupling nut (105) and remove the collars (106). Remove the coupling nut from the piston rod (R). Unscrew the locknuts (104) from the tie rods (103). Separate the motor (101) and lower (102). See FIG. 6.
5. To repair the air motor or lower, see the separate manuals listed under **Related Manuals** on page 2.

Reassembly

NOTE: If the coupling adapter (108) and tie rods (103) have been disassembled from the motor, see **Reassemble the Coupling Adapter and Tie Rods to the Motor** on page 17.

1. See FIG. 6. Assemble the coupling nut (105) to the piston rod (R).
2. Orient the lower (102) to the motor (101). Position the lower on the tie rods (103). Lubricate the threads of the tie rods. Screw the tie rod locknuts (104) onto the tie rods. Torque the tie rod locknuts to 50-55 ft-lb (68-75 N•m).
3. Insert the collars (106) into the coupling nut (105).
   a. *750, 1000, 1500, and 2000cc Pumps:* Tighten the coupling nut onto the coupling adapter (108) and torque to 90-100 ft-lb (122-135 N•m).
   b. *3000 and 4000cc Pumps:* Tighten the coupling nut onto the motor shaft (S) and torque to 150 ft-lb (203 N•m).
4. See FIG. 5. Install the shields (122) by engaging the bottom lips with the groove in the wet-cup cap (C). Snap the two shields together.
5. Flush and test the pump before reinstalling it in the system. Connect hoses and flush the pump. While it is pressurized, check for smooth operation and leaks. Adjust or repair as necessary before reinstalling in the system. Reconnect the pump ground wire before operating.

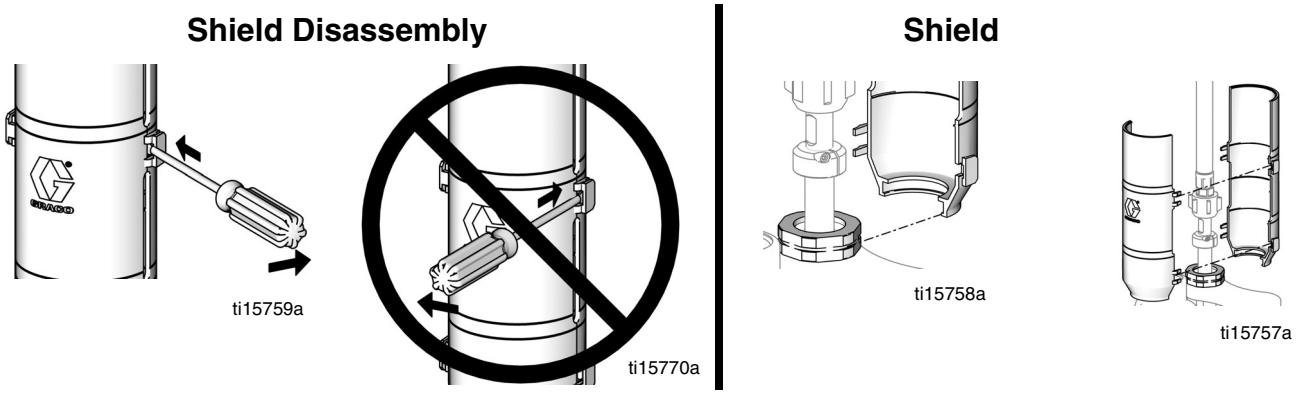
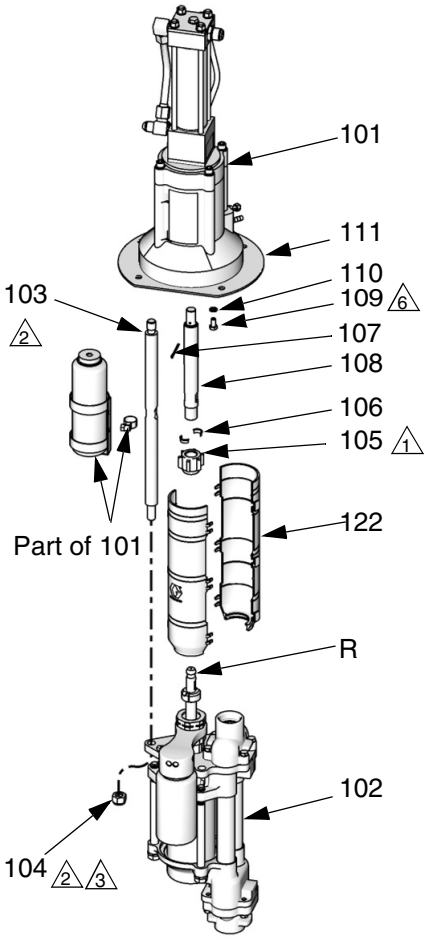


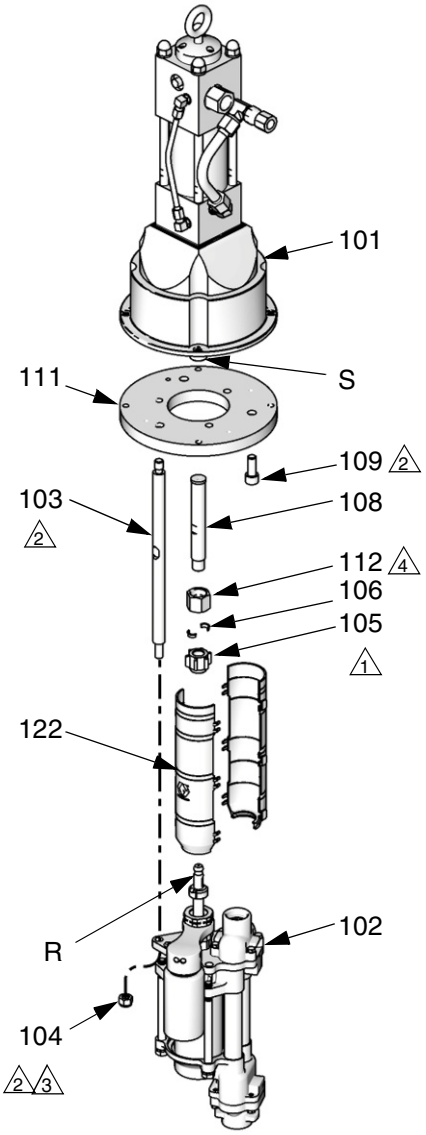
FIG. 5. Disassembly and Reassembly of the Shields

Viscount I Plus Pump with 1000cc 4-Ball Lower



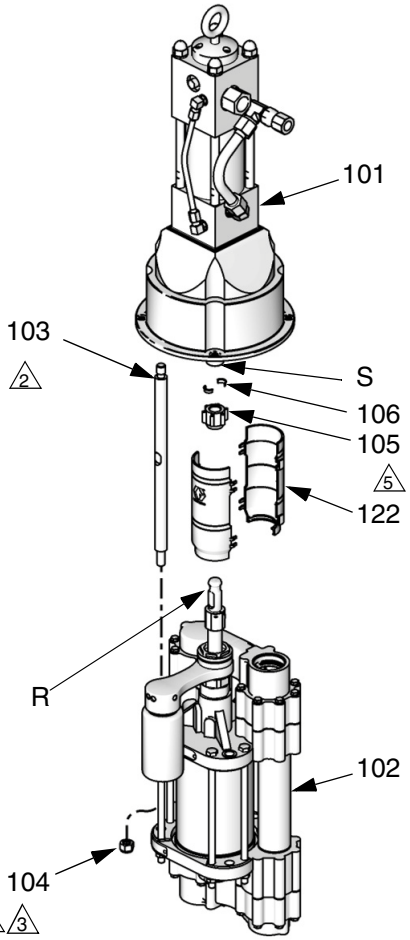
TI15602a

Viscount II Pump with 2000cc 4-Ball Lower



TI15599a

Viscount II Pump with 4000cc 4-Ball Lower



TI15610a

1 Torque to 90-100 ft-lb (122-135 N•m).

2 Torque to 50-55 ft-lb (68-75 N•m).

3 Lubricate threads.

4 Torque to 75-80 ft-lb (102-109 N•m).

5 Torque to 150 ft-lb (203 N•m).

6 Torque to 15-17 ft-lb (20-23 N•m).

FIG. 6. Reassembly

Reassemble the Coupling Adapter and Tie Rods to the Motor

NOTE: Use this procedure only if the coupling adapter (108) and tie rods (103) have been disassembled from the motor, to ensure proper alignment of the motor shaft to the piston rod.

NOTE: 3000 and 4000cc Pumps do not have a coupling adapter (108) or a mounting plate (111).

1. *750, 1000, 1500, and 2000cc Pumps only:* Loosen, but do not remove, the screws holding the mounting plate (111) to the motor (101). See FIG. 6.

2. Install the tie rods (103).

   a. *750, 1000, 1500, and 2000cc Viscount I Plus Pumps:* Screw the tie rods (103) through the mounting plate (111) and into the threaded holes in the base of the motor. Torque to 50-55 ft-lb (68-75 N•m).

   b. *750, 1000, 1500, and 2000cc Viscount II Pumps:* Screw the tie rods (103) into the mounting plate (111) and torque to 50-55 ft-lb (68-75 N•m).

   c. *3000 and 4000cc Pumps:* Screw the tie rods (103) into the base of the motor and torque to 50-55 ft-lb (68-75 N•m).

3. Fill the cavity in the bottom of the motor shaft with grease.

4. *750, 1000, 1500, and 2000cc Pumps only:* Install the coupling adapter (108) as follows.

   a. *Viscount I Plus motors:* Screw the coupling adapter (108) into the motor shaft until the pin holes align. Install the pin (107) in the first hole from the end of the coupling.

   b. *Viscount II motors:* Slide the adapter nut (112) onto the adapter (108). Screw the nut (112) onto the motor shaft (S) and torque to 75-80 ft-lb (102-109 N•m).

5. Orient the lower (102) to the motor (101). Position the lower on the tie rods (103). Lubricate the threads of the tie rods. Loosely screw the tie rod locknuts (104) onto the tie rods.

6. *750, 1000, 1500, and 2000cc Pumps only:* Tighten the mounting plate screws as follows.

   a. *Viscount I Plus motors:* Torque the screws (109) to 15-17 ft-lb (20-23 N•m).

   b. *Viscount II motors:* Torque the screws (109) to 50-55 ft-lb (68-75 N•m).

7. Torque the tie rod locknuts (104) to 50-55 ft-lb (68-75 N•m).

8. Insert the collars (106) into the coupling nut (105).

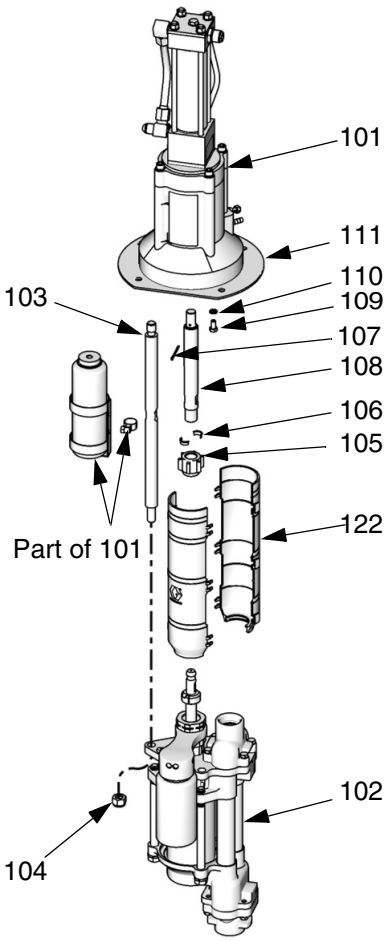
   a. *750, 1000, 1500, and 2000cc Pumps:* Tighten the coupling nut onto the coupling adapter (108) and torque to 90-100 ft-lb (122-135 N•m).

   b. *3000 and 4000cc Pumps:* Tighten the coupling nut onto the motor shaft (S) and torque to 150 ft-lb (203 N•m).

9. Flush and test the pump before reinstalling it in the system. Connect hoses and flush the pump. While it is pressurized, check for smooth operation and leaks. Adjust or repair as necessary before reinstalling in the system. Reconnect the pump ground wire before operating.

Parts

Viscount I Plus Pumps with 750cc, 1000cc, 1500cc, or 2000cc 4-Ball Lowers



TI15602a

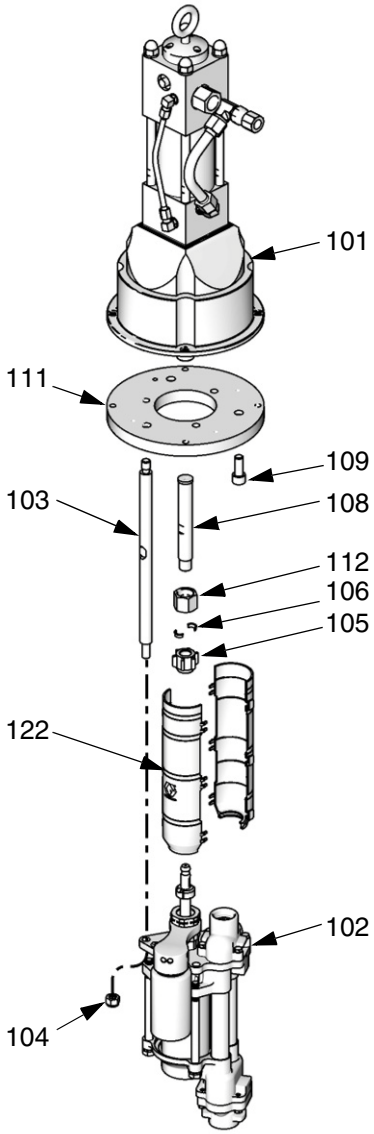
Common Parts

Ref. No.	Description	Part No.	Qty.
101	MOTOR, Viscount I Plus, see manual 308330	261466	1
102	LOWER, 4-Ball, see manual 3A0539	see tables	1
103	TIE ROD, 14.25 in. (362 mm) between shoulders	15G924	3
104	NUT, lock, hex; 9/16-12 unc	108683	3
105	NUT, coupling	184059	1
106	COLLAR, coupling	184128	2
107	PIN, cotter	100103	1
108	ADAPTER, coupling	16C373	1
109	SCREW, cap	100001	4
110	WASHER, lock	100214	4
111	PLATE, mounting	16E086	1
122	SHIELD KIT; includes 2 shields	24F252	1

Parts that Vary by Model

Pump (see page 3)	Lower Size	102 4-Ball Lower (see manual 3A0539)
24E322	750cc	24F420
24E323		24F415
24E324		24F416
24E485		24F413
24E486		24F414
24E325	1000cc	24F431
24E326		24F426
24E327		24F427
24E487		24F424
24E488		24F425
24E328	1500cc	24F439
24E329		24F434
24E330		24F435
24E489		24F432
24E490		24F433
24E331	2000cc	24F447
24E332		24F441
24E333		24F442
24E491		24F440
24E492		24F443

Viscount II Pumps with 2000cc 4-Ball Lower



TI15599a

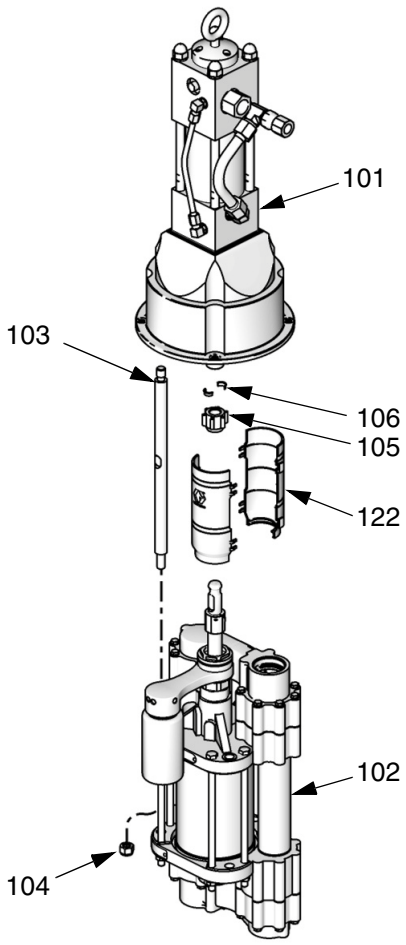
Common Parts

Ref. No.	Description	Part No.	Qty.
101	MOTOR, Viscount II, see manual 308048	223646	1
102	LOWER, 4-Ball, see manual 3A0539	see table	1
103	TIE ROD, 14.25 in. (362 mm) between shoulders	15G924	3
104	NUT, lock, hex; 9/16-12 unc	108683	3
105	NUT, coupling	184059	1
106	COLLAR, coupling	184128	2
108	ADAPTER, coupling	15K736	1
109	SCREW, cap, socket hd	C19789	3
111	PLATE, mounting	120558	1
112	NUT, adapter	183079	1
122	SHIELD KIT; includes 2 shields	24F252	1

Parts that Vary by Model

Pump (see page 3)	Lower Size	102
		4-Ball Lower (see manual 3A0539)
24E334	2000cc	24F447
24E335		24F441
24E336		24F442
24E493		24F440
24E494		24F443

Viscount II Pumps with 3000cc or 4000 cc 4-Ball Lowers



Common Parts

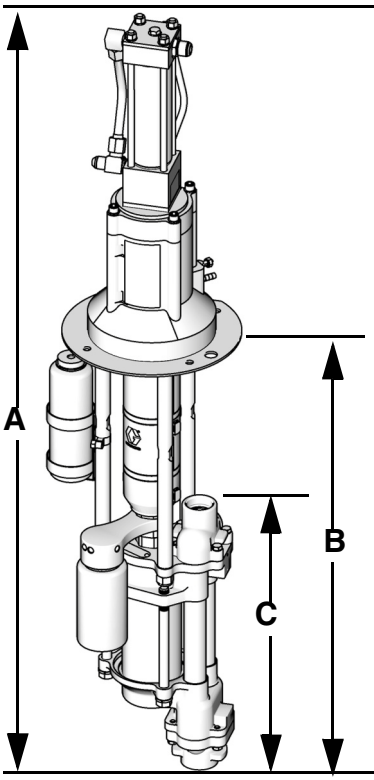
Ref. No.	Description	Part No.	Qty.
101	MOTOR, Viscount II, see manual 308048	223646	1
102	LOWER, 4-Ball, see manual 3A0540	see table	1
103	TIE ROD, 12.72 in. (323 mm) between shoulders	180487	3
104	NUT, lock, hex; 9/16-12 unc	102216	3
105	NUT, coupling	186925	1
106	COLLAR, coupling	184129	2
122	SHIELD KIT; includes 2 shields	24F255	1

Parts that Vary by Model

Pump (see page 3)	Lower Size	102 4-Ball Lower (see manual 3A0540)
24E337	3000cc	24F450
24E338		24F448
24E339		24F449
24E340	4000cc	24F453
24E341		24F451
24E342		24F452

Dimensions

Viscount I Plus Pump with 1000cc 4-Ball Lower



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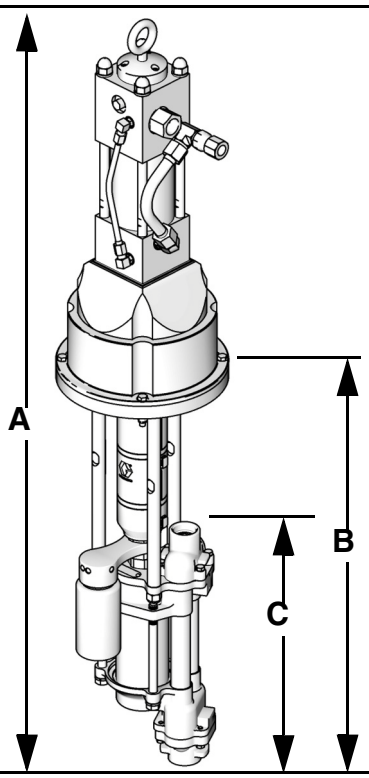
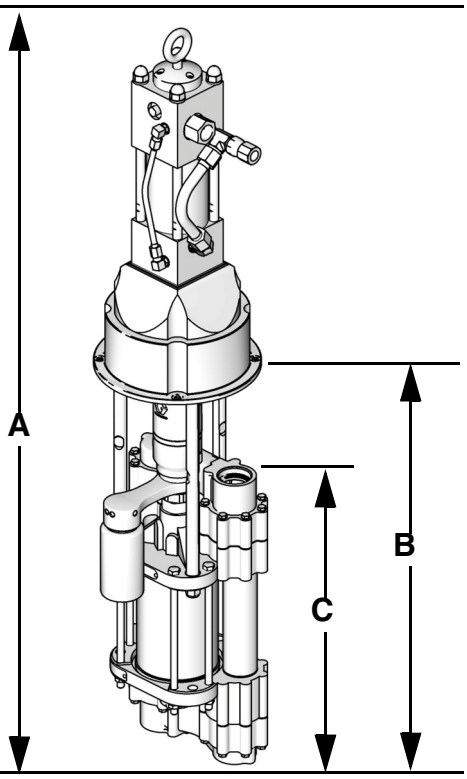
Viscount II Pump with 2000cc 4-Ball Lower



TI15600a

Viscount II Pump with 4000cc 4-Ball Lower



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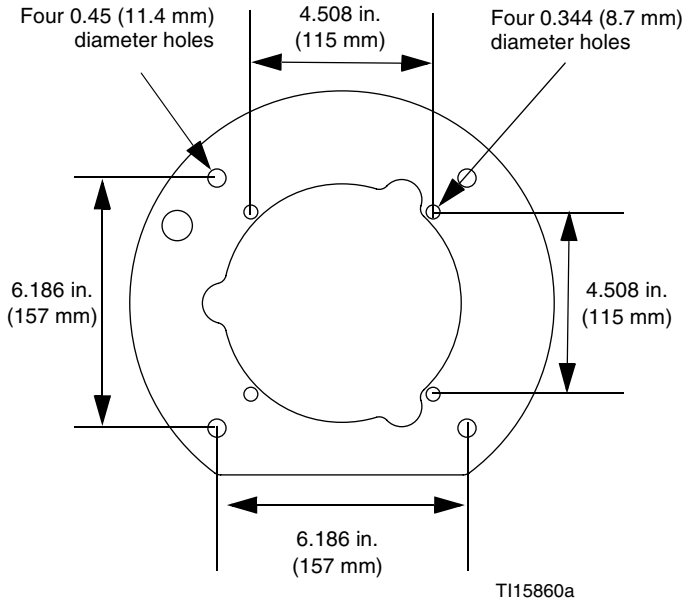
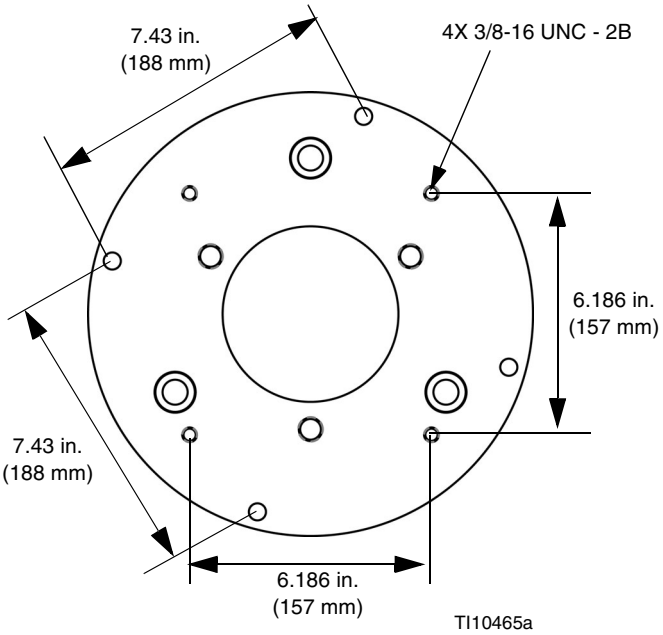
Motor	Lower Size	A in. (mm)	B in. (mm)	C in. (mm)	Approx. Weight lb (kg)
Viscount I Plus	750cc	49.00 (1245)	28.78 (731)	17.4 (442)	74 (33.6)
	1000cc				75 (34.0)
	1500cc				76 (34.5)
	2000cc				77 (34.9)
Viscount II	2000cc	53.72 (1365)	28.78 (731)	17.4 (442)	150 (68.0)
Viscount II	3000cc	54.75 (1391)	29.0 (737)	23.0 (584)	215 (97.5)
	4000cc				217 (98.4)

Motor Mounting Hole Diagrams

Viscount I Plus Adapter Plate 16E086

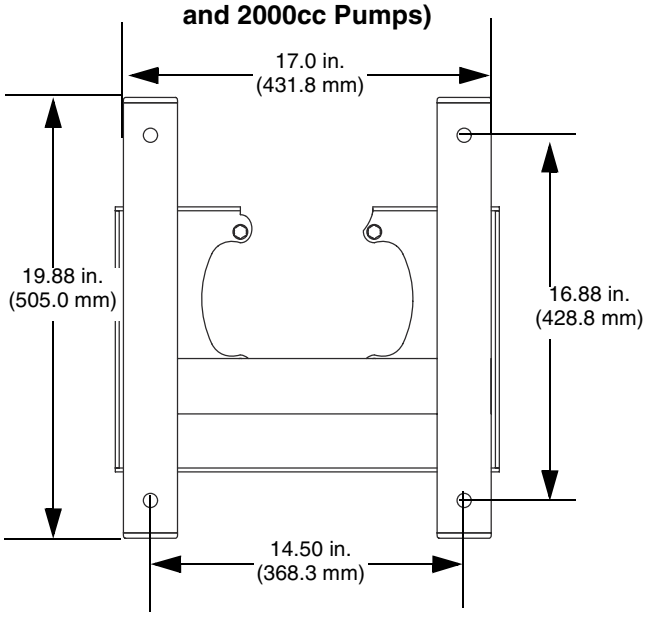


Viscount II Motor Mounting Hole Layout

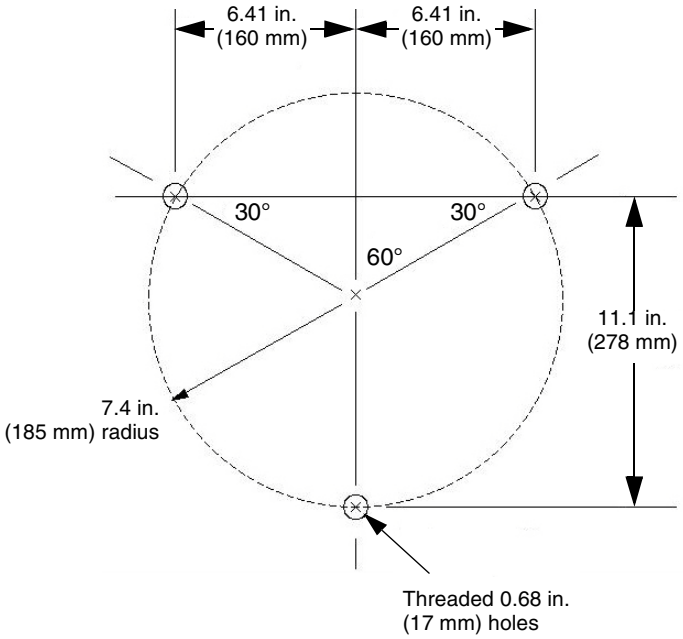


Mounting Stand Hole Layouts

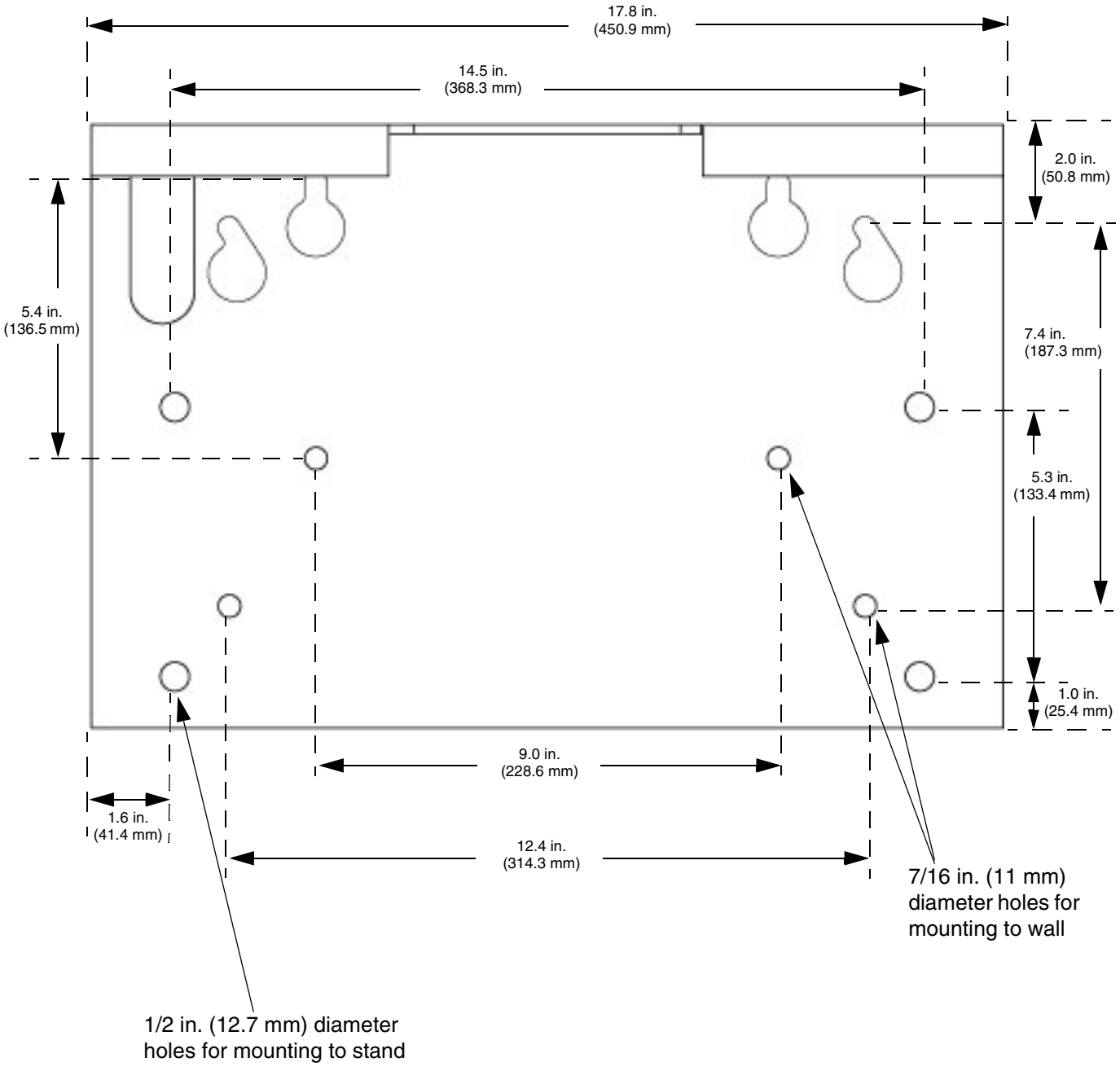
253692 Floor Stand (for 750, 1000, 1500, and 2000cc Pumps)



218742 Floor Stand (for 3000 and 4000cc Pumps)



255143 Wall Mount Bracket



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Technical Data

750, 1000, 1500, and 2000cc Pumps with Viscount I Plus Motor

Model	Lower Size	Maximum Working Pressure psi (MPa, bar)	Maximum Hydraulic Working Pressure psi (MPa, bar)	Hydraulic Oil Consumption	Maximum Hydraulic Motor Fluid Temperature	Fluid Flow at 60 cycles per minute gpm (lpm)	Output per Cycle (cc)	Maximum Fluid Temperature Rating
24E322	750cc	450 (3.1, 31.0)	1500 (10.3, 103.0)	See Performance Chart	134°F (54°C)	9.6 (36.4)	610	150°F (66°C)
24E323	750cc	450 (3.1, 31.0)				9.6 (36.4)	610	
24E324	750cc	450 (3.1, 31.0)				9.6 (36.4)	610	
24E485	750cc	450 (3.1, 31.0)				9.6 (36.4)	610	
24E486	750cc	450 (3.1, 31.0)				9.6 (36.4)	610	
24E325	1000cc	300 (2.1, 21.0)				14.1 (53.5)	890	
24E326	1000cc	300 (2.1, 21.0)				14.1 (53.5)	890	
24E327	1000cc	300 (2.1, 21.0)				14.1 (53.5)	890	
24E487	1000cc	300 (2.1, 21.0)				14.1 (53.5)	890	
24E488	1000cc	300 (2.1, 21.0)				14.1 (53.5)	890	
24E328	1500cc	225 (1.6, 16.0)				19.4 (73.6)	1230	
24E329	1500cc	225 (1.6, 16.0)				19.4 (73.6)	1230	
24E330	1500cc	225 (1.6, 16.0)				19.4 (73.6)	1230	
24E489	1500cc	225 (1.6, 16.0)				19.4 (73.6)	1230	
24E490	1500cc	225 (1.6, 16.0)				19.4 (73.6)	1230	
24E331	2000cc	167 (1.2, 12.0)				26.8 (101.5)	1690	
24E332	2000cc	167 (1.2, 12.0)				26.8 (101.5)	1690	
24E333	2000cc	167 (1.2, 12.0)				26.8 (101.5)	1690	
24E491	2000cc	167 (1.2, 12.0)				26.8 (101.5)	1690	
24E492	2000cc	167 (1.2, 12.0)				26.8 (101.5)	1690	

Sound data: See Viscount I Plus manual 308330.

Wetted parts: See 4-Ball Lower manual 3A0539.

2000cc Pumps with Viscount II Motor

Model	Lower Size	Maximum Working Pressure psi (MPa, bar)	Maximum Hydraulic Working Pressure psi (MPa, bar)	Hydraulic Oil Consumption	Maximum Hydraulic Motor Fluid Temperature	Fluid Flow at 60 cycles per minute gpm (lpm)	Output per Cycle (cc)	Maximum Fluid Temperature Rating
24E334	2000cc	460 (3.2, 32.0)	1200 (8.3, 83.0)	See Performance Chart	134°F (54°C)	31.5 (119.3)	2000	150°F (66°C)
24E335	2000cc							
24E336	2000cc							
24E493	2000cc							
24E494	2000cc							

Sound data: See Viscount II manual 308048.

Wetted parts: See 4-Ball Lower manual 3A0539.

3000 and 4000cc Pumps with Viscount II Motor

Model	Lower Size	Maximum Working Pressure psi (MPa, bar)	Maximum Hydraulic Working Pressure psi (MPa, bar)	Hydraulic Oil Consumption	Maximum Hydraulic Motor Fluid Temperature	Fluid Flow at 60 cycles per minute gpm (lpm)	Output per Cycle (cc)	Maximum Fluid Temperature Rating
24E337	3000cc	400 (2.8, 28.0)	1200 (8.3, 83.0)	See Performance Chart	134°F (54°C)	47.3 (179)	3000	150°F (66°C)
24E338	3000cc	400 (2.8, 28.0)				47.3 (179)	3000	
24E339	3000cc	400 (2.8, 28.0)				47.3 (179)	3000	
24E340	4000cc	300 (2.1, 21.0)				63 (238.6)	4000	
24E341	4000cc	300 (2.1, 21.0)				63 (238.6)	4000	
24E342	4000cc	300 (2.1, 21.0)				63 (238.6)	4000	

Sound data: See Viscount II manual 308048.

Wetted parts: See 4-Ball Lower manual 3A0540.

Performance Charts

To find Fluid Outlet Pressure (psi/MPa/bar) at a specific fluid flow (lpm/gpm) and operating hydraulic pressure (psi/MPa/bar):

1. Locate desired flow along bottom of chart.
2. Follow vertical line up to intersection with selected fluid outlet pressure curve (black). Follow left to scale to read fluid outlet pressure.

See **Models** on page 3 for your pump part number.

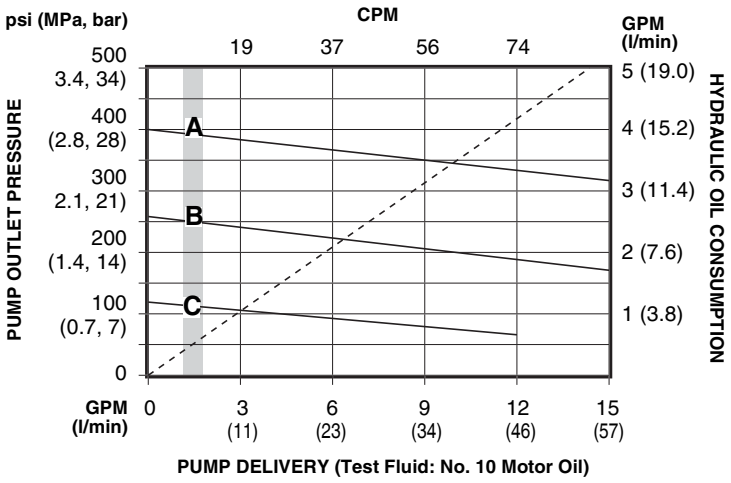
To find Motor Hydraulic Oil Consumption (l/min. or gpm) at a specific fluid flow (l/min. or gpm):

1. Locate desired flow along bottom of chart.
2. Read vertical line up to intersection with hydraulic oil consumption curve (dashes). Follow right to scale to read hydraulic oil consumption.

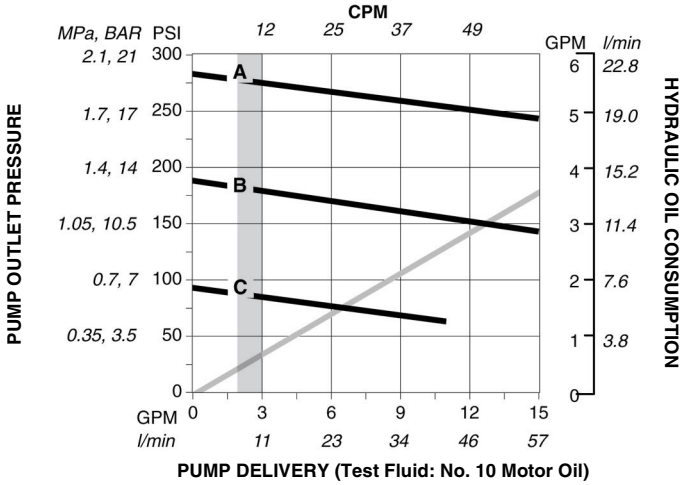
Key:
A 10.3 MPa, 103 bar (1500 psi) hydraulic pressure
B 7.2 MPa, 72.4 bar (1050 psi) hydraulic pressure
C 4.1 MPa, 41 bar (600 psi) hydraulic pressure

NOTE: The shaded area within the table shows the recommended range for continuous duty circulation applications.

Viscount I Plus Motor, 750cc Lower



Viscount I Plus Motor, 1000cc Lower



See **Models** on page 3 for your pump part number.

Key:

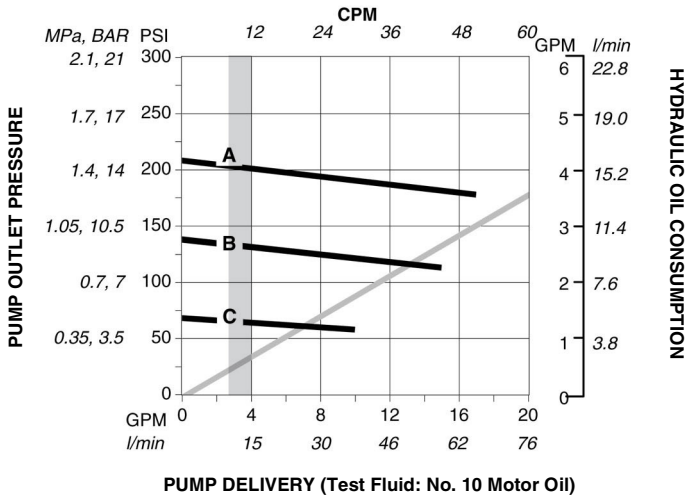
A 10.3 MPa, 103 bar (1500 psi) hydraulic pressure

B 7.2 MPa, 72.4 bar (1050 psi) hydraulic pressure

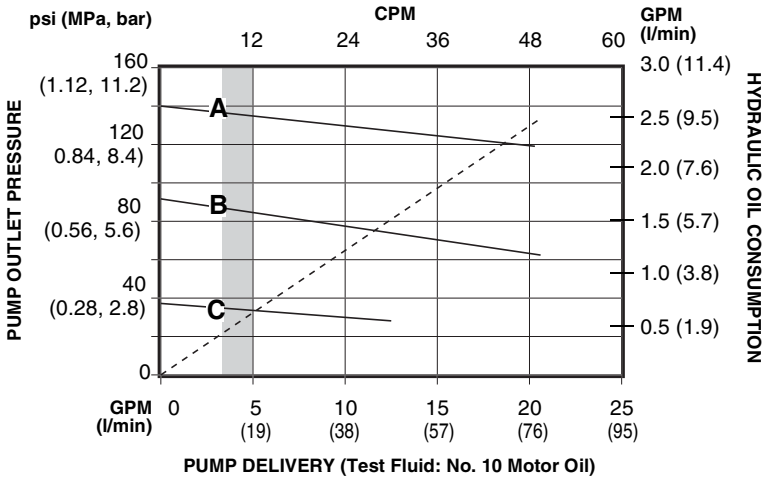
C 4.1 MPa, 41 bar (600 psi) hydraulic pressure

NOTE: The shaded area within the table shows the recommended range for continuous duty circulation applications.

Viscount I Plus Motor, 1500cc Lower



Viscount I Plus Motor, 2000cc Lower



See **Models** on page 3 for your pump part number.

Key:

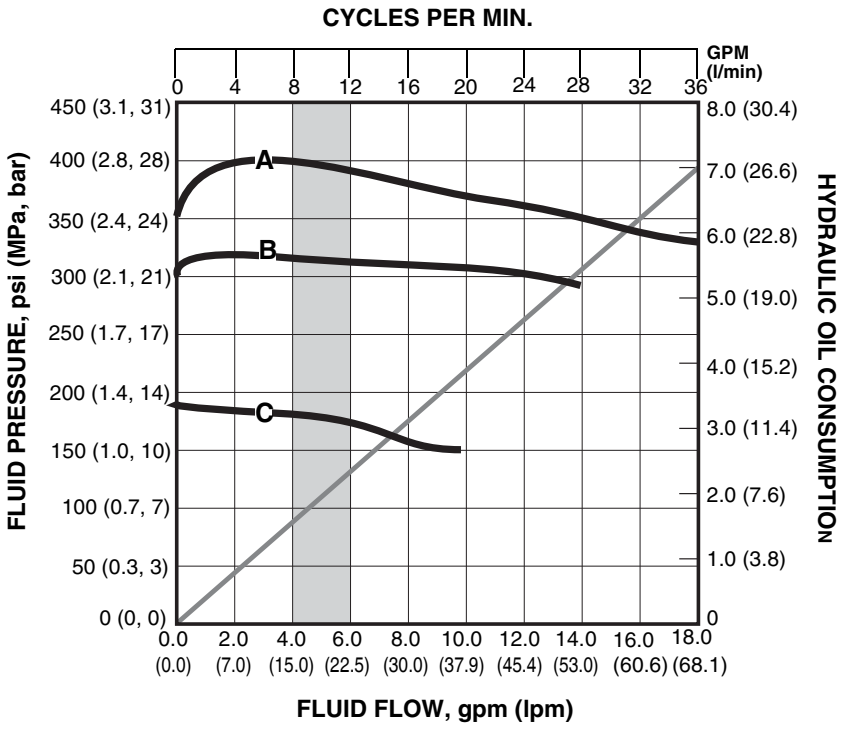
A 10.3 MPa, 103 bar (1500 psi) hydraulic pressure

B 7.2 MPa, 72.4 bar (1050 psi) hydraulic pressure

C 4.1 MPa, 41 bar (600 psi) hydraulic pressure

NOTE: The shaded area within the table shows the recommended range for continuous duty circulation applications.

Viscount II Motor, 2000cc Lower



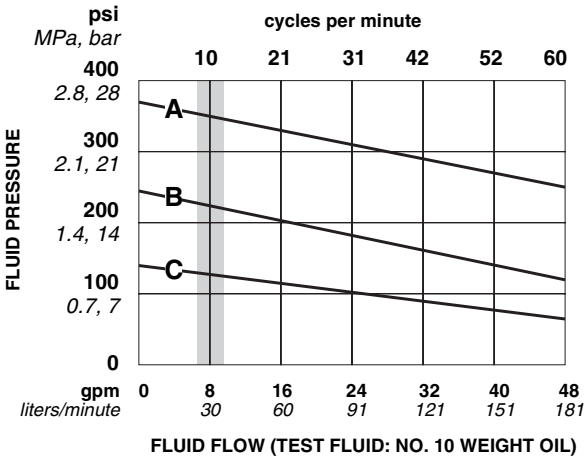
See **Models** on page 3 for your pump part number.

Key:
A 10.3 MPa, 103 bar (1500 psi) hydraulic pressure
B 7.2 MPa, 72.4 bar (1050 psi) hydraulic pressure
C 4.1 MPa, 41 bar (600 psi) hydraulic pressure

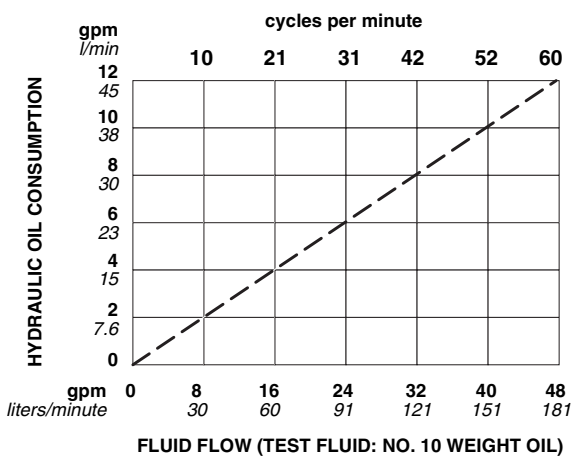
NOTE: The shaded area within the table shows the recommended range for continuous duty circulation applications.

Viscount II Motor, 3000cc Lower

Fluid Outlet Pressure

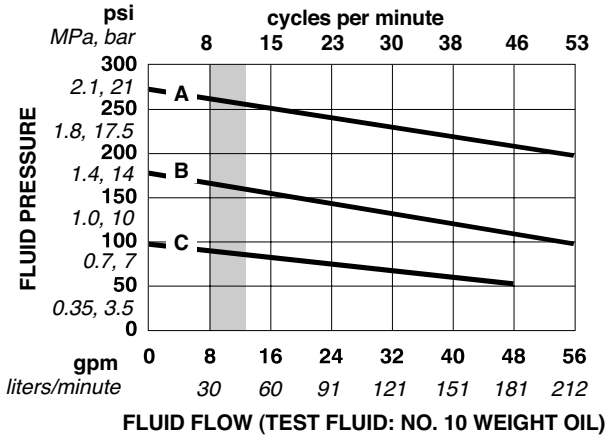


Hydraulic Oil Consumption

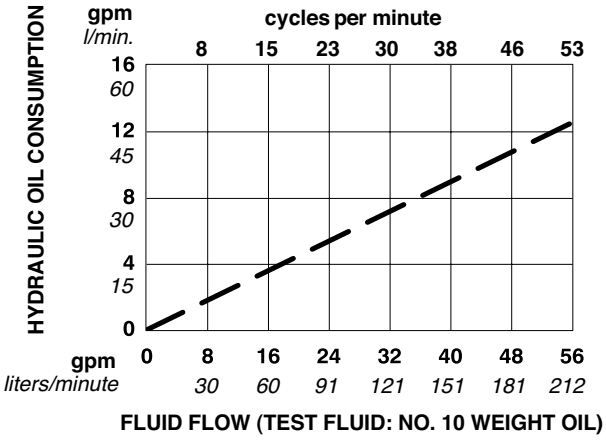


Viscount II Motor, 4000cc Lower

Fluid Outlet Pressure



Hydraulic Oil Consumption



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Original instructions. This manual contains English. MM 3A0537

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